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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/EP2004/010632	International filing date *(day/month/year)* 20.09.2004	Priority date *(day/month/year)* 04.10.2003
International Patent Classification (IPC) or national classification and IPC C11D11/04		
Applicant UNILEVER PLC et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 2 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23.02.2005	25.05.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Hillebrecht, D Telephone No. +49 89 2399-8168

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/010632

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   Description, Pages

   1-13 as originally filed

   Claims, Numbers

   1-8 filed with the demand

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-8
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-8
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-8
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1: EP-A-0651050
D2: US-B-6294513
D3: US-B-6576605
D4: WO-A-02/24855
D5: EP-A-0508543

V. The subject-matter of claim 1 is novel and involves an inventive step (Article 33(1) to (3) PCT).

1. Claim 1 defines a method for making continuously a particulate detergent composition wherein starting materials comprising a surfactant acid and a particulate alkaline neutralising agent are fed into a mixer/granulator to produce a granulated product stream. A mass fraction of 30 to 50% of the product stream of this product is subjected to cooling and recycled into the mixer/granulator. Moreover, the number average particle size of the recycle stream is less than that of the product stream. None of D1 to D5 discloses a method wherein the recycle stream is from 30 to 50 % of the mass flow of the product stream.

2. The present application seeks to provide a method for making continuously a particulate detergent composition. According to the specification a great flexibility in control of the granulation temperature can be achieved, when a recycle stream is cooled.
D3 discloses a continuous process for preparing particulate detergent composition, wherein a surfactant acid is neutralised with particulate alkalis. The reaction product is classified and optionally fines are recycled to the main production stream from a fluid bed cooler via a mixer. See D3, claim 1, column 3, lines 48 to 67, and column 8, lines 59 to 62. However, there is no teaching in D3 that sufficient cooling can be achieved by cooling the recycling loop comprising primarily fines.

D1 , page 8, lines 39 to 46 discloses a continuos process for preparing particulate detergent composition, which differs from the presently claimed subject-matter that the only neutralising agent mentioned therein is an aqueous solution of NaOH.

Moreover, D1 is directed to the neutralisation of a surfactant acid in this paragraph, and is thus a precursor process.
Also D2, the only example utilises aqueous NaOH for neutralizing the surfactant acid.
Thus, there is no incentive in the prior art documents to increase the mass flow in the recycle loop to improve the cooling performance.

VIII. The specification was not adapted to the present set of claims. (Article 6 PCT)

CLAIMS

1. A continuous process for making a particulate detergent composition or component which comprises feeding starting materials comprising a surfactant acid precursor of an anionic surfactant and a particulate alkaline neutralising agent into a mixer/granulator to produce a granulated product stream, characterised in that a fraction of the product stream is cooled and recycled into the mixer/granulator, the recycle stream being from 30 to 50% of the mass flow rate of the product stream and wherein the recycle stream immediately after separation from the product stream contains particles which have a number average particle size which is less < >.

2. A process according to claim 1, wherein the temperature of the recycle stream is at least 10°C below, preferably at least 20°C below, more preferably at least 30°C below, more preferably at least 40°C below, most preferably at least 50°C below that of the mixer/granulator.

3. A process according to claim 1 or claim 2, wherein the recycle stream immediately after separation from the product stream contains particles which have a number average particle size which is ~~less than that of the product stream, proferably~~ less than 50% of that of the product stream, more preferably less than 30% of that of the product stream.

4. A process as claimed in any preceding claim, wherein the recycle stream has a surfactant concentration which is within 5%, preferably within 3%, ideally within 2%, of that of the product stream.

< than that of the product stream >

5. A process as claimed in any preceding claim, wherein the product stream enters a fluidised bed and an exit stream from the fluidised bed is the recycle stream.

~~6. A process as claimed in any preceding claim, wherein the recycle stream is from 25 to 60% of the mass flow rate of the product stream, preferably from 30 to 50%.~~

6 7. A process as claimed in any preceding claim, wherein the temperature in the mixer/granulator is no greater than 100°C, preferably no greater than 80°C

7 8. A process as claimed in any preceding claim, wherein the starting materials comprise a first feed stream comprising at least 10 wt% of surfactant acid precursor and a second feed stream comprising a particulate alkaline neutralising agent and optionally an additional feed stream in addition to the recycle stream.

9 9. A process as claimed in any preceding claim, wherein the starting materials comprise a heat-sensitive surfactant or acid precursor thereof.

~~10. A process as claimed in any preceding claim, wherein the surfactant acid precursor is of an anionic surfactant.~~